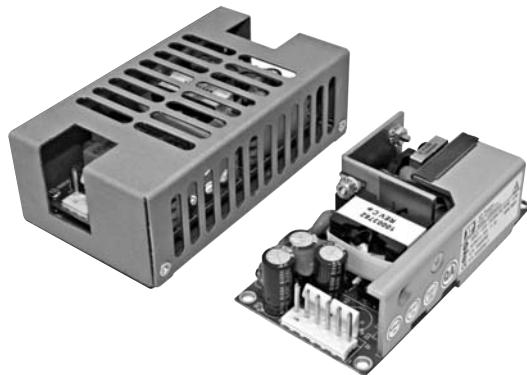


## ECM Series



- Compact Size - High Power Density
- Industrial & Medical Approvals
- Low Leakage Current
- Level B Conducted Emissions
- EN61000-3-2, -3 Compliant
- Convection-cooled
- Class II Approved 40-60 W Models

## Specification

**Input**

|                       |   |
|-----------------------|---|
| Input Voltage         | • 90-264 VAC (120-370 VDC)  |
| Input Frequency       | • 47-63 Hz; 440 Hz  |
| Input Current         | • 40 W: 0.4 A max at 230 VAC<br>60 W: 0.6 A max at 230 VAC<br>100 W: 0.9 A max at 230 VAC |
| Inrush Current        | • 40 A max at 230 VAC   |
| Earth Leakage Current | • <100 µA at 115 VAC<br><200 µA at 230 VAC  |
| Input Protection      | • Internal 3.15 A fuse in line and neutral  |

**Output**

|                          |   |
|--------------------------|---|
| Output Voltage           | • See tables  |
| Output Voltage Trim      | • ±5% on 3.3 V & 5 V versions, ±10% on other single output models and V1 of multi-output models. See note 1 for ECM40/60 models |
| Initial Set Accuracy     | • ±1.0% V1, ±5% V2, V3 & V4   |
| Minimum Load             | • See tables  |
| Start Up Delay           | • 2 s max   |
| Start Up Rise Time       | • 50 ms   |
| Hold Up Time             | • 16/75 ms min at 115/230 VAC   |
| Line Regulation          | • ±0.5%   |
| Load Regulation          | • ±1% single output models;<br>±3% V1, ±5% V2 & V3 ECM40/60 multi-output models.<br>±1% V1 & V2, ±5% V3 & V4 ECM100             |
| Cross Regulation         | • 2% on ECM40/60 only   |
| Over/Undershoot          | • None at turn on/off   |
| Transient Response       | • 4% max. deviation, recovery to within 1% in 500 µs for a 25% load change  |
| Ripple & Noise           | • 1% pk-pk, 20 MHz bandwidth  |
| Overvoltage Protection   | • 115-135% Vnom, recycle input to reset   |
| Overload Protection      | • 110-150% on primary power limit, auto recovery  |
| Short Circuit Protection | • Trip and restart (Hiccup mode)  |
| Temperature Coefficient  | • 0.05%/°C  |

**General**

|                     |  |
|---------------------|--|
| Efficiency          | • 80-85% depending on model  |
| Isolation           | • 4000 VAC Input to Output<br>1500 VAC Input to Ground<br>500 VAC Output to Ground |
| Switching Frequency | • 70 kHz typical   |
| Power Density       | • 60 W: 6.25 W/in <sup>3</sup><br>100 W: 7.40 W/in <sup>3</sup>                    |
| MTBF                | • 250 kHrs per MIL-HDBK-217F   |

**Environmental**

|                       |  |
|-----------------------|--|
| Operating Temperature | • 0 °C to +70 °C. Refer to derating curves for specific operating limitations. |
| Cooling               | • Convection & fan-cooled ratings (see derating curves)                        |
| Operating Humidity    | • 95% RH, non-condensing   |
| Storage Temperature   | • -20 °C to +85 °C   |
| Operating Altitude    | • 3000 m   |
| Shock                 | • 30 g pk, half sine, 6 axes   |
| Vibration             | • 2 g rms, 5 Hz to 500 kHz, 3 axes   |

**EMC & Safety**

|                      |  |
|----------------------|--|
| Emissions            | • EN60601-1-2, EN61204-3, FCC 20780, EN55022 & EN55011, level B conducted            |
| Harmonic Currents    | • EN61000-3-2  |
| Voltage Flicker      | • EN61000-3-3  |
| ESD Immunity         | • EN61000-4-2, level 2 Perf Criteria A   |
| Radiated Immunity    | • EN61000-4-3, 10 V/m Perf Criteria A  |
| EFT/Burst            | • EN61000-4-4, level 3 Perf Criteria A   |
| Surge                | • EN61000-4-5, level 3 Perf Criteria A   |
| Conducted Immunity   | • EN61000-4-6, 10 V Perf Criteria A  |
| Dips & Interruptions | • EN61000-4-11, 30% 10 ms, 60% 100 ms, 100% 5000 ms Perf Criteria A, B, B            |
| Safety Approvals     | • EN60950, UL60950, CSA 22.2 601.1, EN60601-1, UL60601-1, CCC pending, contact sales |

## Models and Ratings

| Max Power | Output 1 |                                | Output 2 |                 | Output 3 |                 | Model Number <sup>②</sup> |
|-----------|----------|--------------------------------|----------|-----------------|----------|-----------------|---------------------------|
|           | Voltage  | Current Min/Max <sup>(3)</sup> | Voltage  | Current Min/Max | Voltage  | Current Min/Max |                           |
| 40 W      | +5.0 V   | 0.0 A/8.0 A                    |          |                 |          |                 | ECM40US05†^               |
|           | +7.0 V   | 0.0 A/5.7 A                    |          |                 |          |                 | ECM40US07                 |
|           | +9.0 V   | 0.0 A/4.4 A                    |          |                 |          |                 | ECM40US09†                |
|           | +12.0 V  | 0.0 A/3.5 A                    |          |                 |          |                 | ECM40US12†^               |
|           | +15.0 V  | 0.0 A/2.7 A                    |          |                 |          |                 | ECM40US15†^               |
|           | +18.0 V  | 0.0 A/2.2 A                    |          |                 |          |                 | ECM40US18                 |
|           | +24.0 V  | 0.0 A/1.7 A                    |          |                 |          |                 | ECM40US24†^               |
|           | +33.0 V  | 0.0 A/1.2 A                    |          |                 |          |                 | ECM40US33                 |
|           | +48.0 V  | 0.0 A/0.9 A                    |          |                 |          |                 | ECM40US48†^               |
|           | +5.0 V   | 0.5 A/6.0 A                    | +12.0 V  | 0.1 A/2.0 A     |          |                 | ECM40UD21                 |
|           | +5.0 V   | 0.5 A/6.0 A                    | +15.0 V  | 0.1 A/1.5 A     |          |                 | ECM40UD22                 |
|           | +5.0 V   | 0.5 A/6.0 A                    | +12.0 V  | 0.1 A/2.0 A     | -12.0 V  | 0.0 A/0.5 A     | ECM40UT31†^               |
|           | +5.0 V   | 0.5 A/6.0 A                    | +24.0 V  | 0.1 A/1.0 A     | -12.0 V  | 0.0 A/0.5 A     | ECM40UT32†                |
|           | +5.0 V   | 0.5 A/6.0 A                    | +15.0 V  | 0.1 A/1.5 A     | -15.0 V  | 0.0 A/0.5 A     | ECM40UT33†^               |
|           | +3.3 V   | 0.5 A/6.0 A                    | +5.0 V   | 0.1 A/1.5 A     | +12.0 V  | 0.0 A/0.5 A     | ECM40UT34†^               |
|           | +5.0 V   | 0.5 A/6.0 A                    | +3.3 V   | 0.1 A/1.5 A     | +12.0 V  | 0.0 A/0.5 A     | ECM40UT35†                |

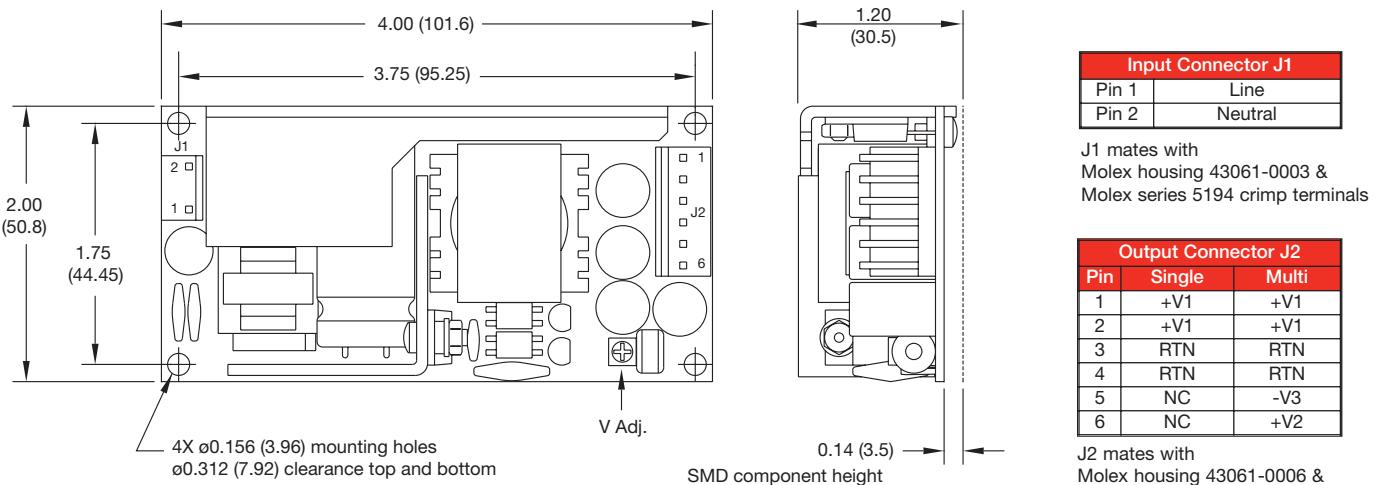
### Notes

1. V2 will track a change in V1 by the same percentage change in voltage as V1 is trimmed.
2. To receive unit with cover fitted, add suffix '-C' to model number. For Class I operation only.
3. A 120% peak load can be taken for up to 100 ms with a 25% duty cycle. Average load not to exceed 40 W.

† Available from Farnell. See pages 204-206.

^ Available from Newark. See pages 207-208.

## Mechanical Details

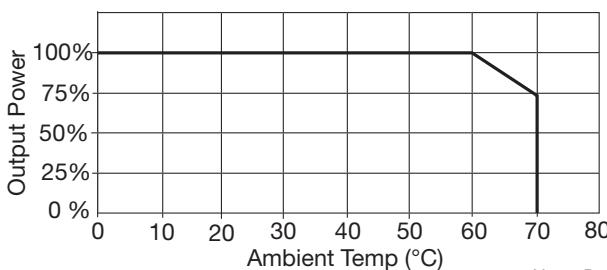


### Notes

1. All dimensions in inches (mm). Tolerance .xx = ±0.02 (0.50); .xxx = ±0.01 (0.25)
2. Cable harnesses with 300 mm wire available.  
For single output models, order part number ECM40/60S LOOM†.  
For multi-output models, order part number ECM40/60DT LOOM†.
3. Mating connector kit available. Order part number ECM40/60 CONKIT†.
4. Covers available. Order part number ECM40/60 COVER†. Cover dimensions are 4.49 x 2.52 x 1.52 (114 x 64 x 38.5)

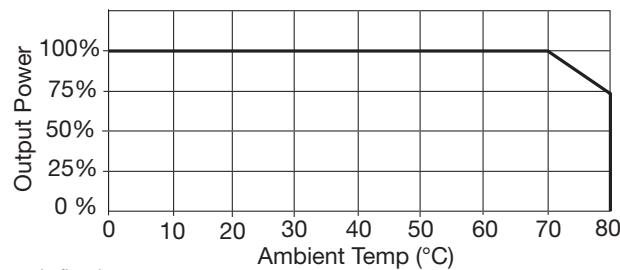
## Derating Curves

All ECM40 models convection-cooled



Note: Derate by 10% if cover is fitted

All ECM40 models with 5 CFM



Consult longform datasheet for installation information regarding optimum thermal ratings in convection-cooled applications.

**Models and Ratings****ECM60 XP**

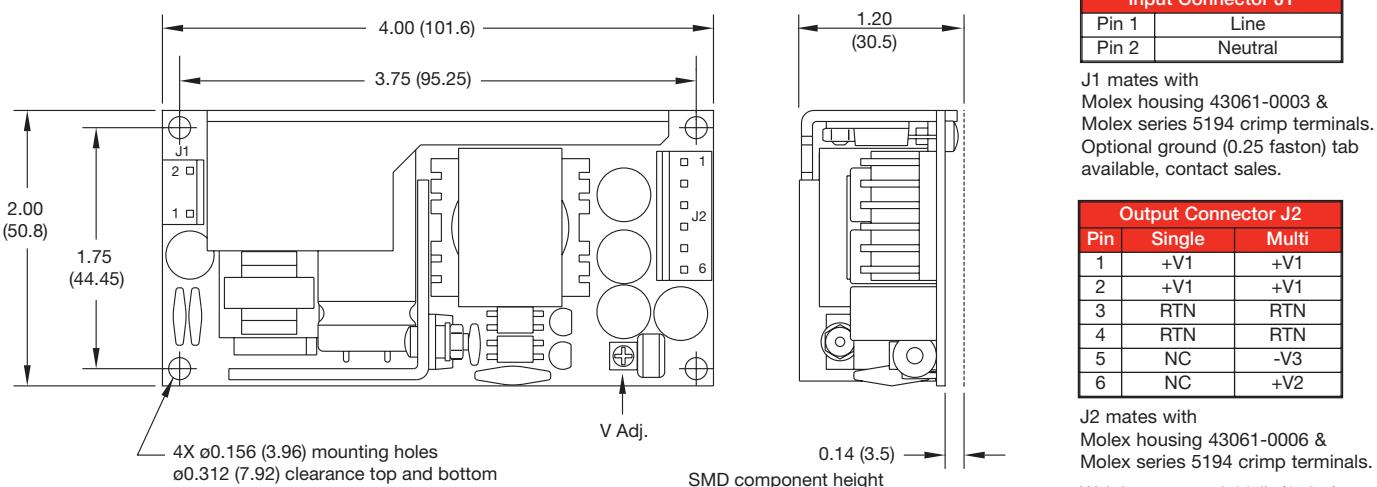
| Max Power | Output 1 |                              | Output 2 |                 | Output 3 |                 | Model Number <sup>②</sup> |
|-----------|----------|------------------------------|----------|-----------------|----------|-----------------|---------------------------|
|           | Voltage  | Current Min/Max <sup>③</sup> | Voltage  | Current Min/Max | Voltage  | Current Min/Max |                           |
| 60 W      | +5.0 V   | 0.0 A/12.00 A                |          |                 |          |                 | ECM60US05†^               |
|           | +7.0 V   | 0.0 A/8.60 A                 |          |                 |          |                 | ECM60US07                 |
|           | +9.0 V   | 0.0 A/6.70 A                 |          |                 |          |                 | ECM60US09†^               |
|           | +12.0 V  | 0.0 A/5.00 A                 |          |                 |          |                 | ECM60US12†^               |
|           | +15.0 V  | 0.0 A/4.00 A                 |          |                 |          |                 | ECM60US15†^               |
|           | +18.0 V  | 0.0 A/3.30 A                 |          |                 |          |                 | ECM60US18                 |
|           | +20.0 V  | 0.0 A/3.00 A                 |          |                 |          |                 | ECM60US20                 |
|           | +24.0 V  | 0.0 A/2.50 A                 |          |                 |          |                 | ECM60US24†^               |
|           | +33.0 V  | 0.0 A/1.80 A                 |          |                 |          |                 | ECM60US33                 |
|           | +48.0 V  | 0.0 A/1.25 A                 |          |                 |          |                 | ECM60US48†^               |
|           | +5.0 V   | 0.5 A/8.00 A                 | +12.0 V  | 0.1 A/3.0 A     |          |                 | ECM60UD21                 |
|           | +5.0 V   | 0.5 A/8.00 A                 | +15.0 V  | 0.1 A/2.5 A     |          |                 | ECM60UD22                 |
|           | +5.0 V   | 0.5 A/8.00 A                 | +12.0 V  | 0.1 A/3.0 A     | -12.0 V  | 0.0 A/0.5 A     | ECM60UT31†^               |
|           | +5.0 V   | 0.5 A/8.00 A                 | +24.0 V  | 0.1 A/1.5 A     | -12.0 V  | 0.0 A/0.5 A     | ECM60UT32†                |
|           | +5.0 V   | 0.5 A/8.00 A                 | +15.0 V  | 0.1 A/2.5 A     | -15.0 V  | 0.0 A/0.5 A     | ECM60UT33†^               |
|           | +3.3 V   | 0.5 A/8.00 A                 | +5.0 V   | 0.1 A/1.5 A     | +12.0 V  | 0.0 A/0.5 A     | ECM60UT34†^               |
|           | +5.0 V   | 0.5 A/8.00 A                 | +3.3 V   | 0.1 A/1.5 A     | +12.0 V  | 0.0 A/0.5 A     | ECM60UT35†                |

**Notes**

1. V2 will track a change in V1 by the same percentage change in voltage as V1 is trimmed.
2. To receive unit with cover fitted, add suffix '-C' to model number. For Class I operation only.
3. A 120% peak load can be taken for up to 100 ms with a 25% duty cycle. Average load not to exceed 60 W.
4. 48 V DC input version of 12 V single output model available in OEM quantities (DCM6048S12). Contact sales for details.

† Available from Farnell. See pages 204-206.

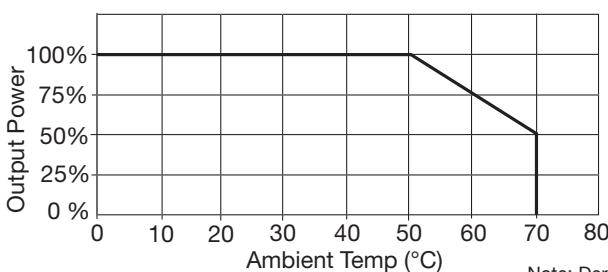
^ Available from Newark. See pages 207-208.

**Mechanical Details****Notes**

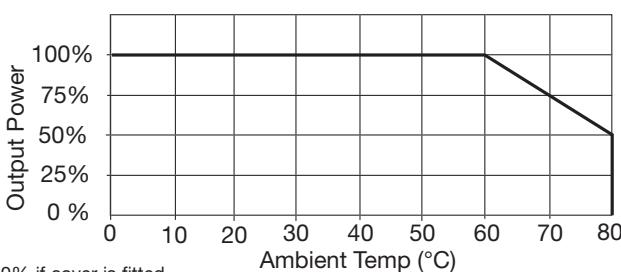
1. All dimensions in inches (mm). Tolerance .xx = ±0.02 (0.50); .xxx = ±0.01 (0.25)
2. Cable harnesses with 300 mm wire available.
- For single output models, order part number ECM40/60S LOOM†.
- For multi-output models, order part number ECM40/60DT LOOM†.
3. Mating connector kit available. Order part number ECM40/60 CONKIT†.
4. Covers available. Order part number ECM40/60 COVER†. Cover dimensions are 4.49 x 2.52 x 1.52 (114 x 64 x 38.5).
5. Selected single output models available in a 3" x 5" footprint for OEM quantities. Contact sales for details.

**Derating Curves**

All ECM60 models convection-cooled



All ECM60 models with 5 CFM



Consult longform datasheet for installation information regarding optimum thermal ratings in convection-cooled applications.



T H E X P E R T S I N P O W E R

**Models and Ratings****Single Output Models**

| Output Voltage | Output Current |         |                    | Model Number <sup>1,3)</sup> |
|----------------|----------------|---------|--------------------|------------------------------|
|                | Minimum        | Maximum | with 5 CFM Cooling |                              |
| +3.3 V         | 0.0 A          | 15.0 A  | 20.0 A             | ECM100US03*†^                |
| +5.0 V         | 0.0 A          | 15.0 A  | 20.0 A             | ECM100US05*†^                |
| +7.0 V         | 0.0 A          | 11.4 A  | 14.3 A             | ECM100US07*                  |
| +9.0 V         | 0.0 A          | 8.8 A   | 11.1 A             | ECM100US09*†                 |
| +12.0 V        | 0.0 A          | 7.5 A   | 8.3 A              | ECM100US12*†^                |
| +15.0 V        | 0.0 A          | 6.0 A   | 6.6 A              | ECM100US15*†^                |
| +18.0 V        | 0.0 A          | 5.0 A   | 5.5 A              | ECM100US18*                  |
| +24.0 V        | 0.0 A          | 4.1 A   | 4.1 A              | ECM100US24*†^                |
| +33.0 V        | 0.0 A          | 3.0 A   | 3.0 A              | ECM100US33*                  |
| +48.0 V        | 0.0 A          | 2.1 A   | 2.1 A              | ECM100US48*†^                |

**Multi Output Models**

| Output Power Convection Cooled | Output Power Forced Air 5 CFM | Output 1 |                 | Output 2 |                 | Output 3 |                 | Output 4 |                 | Model Number <sup>1,3)</sup> |
|--------------------------------|-------------------------------|----------|-----------------|----------|-----------------|----------|-----------------|----------|-----------------|------------------------------|
|                                |                               | Voltage  | Current Min/Max |                              |
| 80 W                           | 100 W                         | +5.0 V   | 0.0 A/12.0 A    | +12.0 V  | 0.0 A/3.0 A     |          |                 |          |                 | ECM100UD21*                  |
| 80 W                           | 100 W                         | +5.0 V   | 0.0 A/12.0 A    | +15.0 V  | 0.0 A/3.0 A     |          |                 |          |                 | ECM100UD22*                  |
| 75 W                           | 100 W                         | +5.0 V   | 0.5 A/10.0 A    | +12.0 V  | 0.0 A/3.0 A     | -12.0 V  | 0.0 A/0.8 A     |          |                 | ECM100UT31*†^                |
| 80 W                           | 100 W                         | +5.0 V   | 0.5 A/10.0 A    | +24.0 V  | 0.0 A/2.0 A     | -12.0 V  | 0.0 A/0.8 A     |          |                 | ECM100UT32*                  |
| 80 W                           | 100 W                         | +5.0 V   | 0.5 A/10.0 A    | +15.0 V  | 0.0 A/3.0 A     | -15.0 V  | 0.0 A/0.8 A     |          |                 | ECM100UT33*†^                |
| 65 W                           | 100 W                         | +3.3 V   | 0.5 A/10.0 A    | +5.0 V   | 0.0 A/5.0 A     | +12.0 V  | 0.0 A/0.8 A     |          |                 | ECM100UT34*†^                |
| 70 W                           | 100 W                         | +5.0 V   | 0.5 A/10.0 A    | +3.3 V   | 0.0 A/5.0 A     | +12.0 V  | 0.0 A/0.8 A     |          |                 | ECM100UT35*                  |
| 80 W                           | 100 W                         | +5.0 V   | 0.5 A/10.0 A    | +12.0 V  | 0.0 A/3.0 A     | -5.0 V   | 0.0 A/0.8 A     |          |                 | ECM100UT36*                  |
| 70 W                           | 100 W                         | +5.0 V   | 0.5 A/10.0 A    | +15.0 V  | 0.0 A/3.0 A     | -5.0 V   | 0.0 A/0.8 A     |          |                 | ECM100UT37*                  |
| 65 W                           | 100 W                         | +5.0 V   | 0.5 A/10.0 A    | +3.3 V   | 0.1 A/5.0 A     | +12.0 V  | 0.0 A/0.8 A     | -12.0 V  | 0.0 A/0.5 A     | ECM100UQ41*†^                |
| 60 W                           | 100 W                         | +3.3 V   | 0.5 A/10.0 A    | +5.0 V   | 0.1 A/5.0 A     | +12.0 V  | 0.0 A/0.8 A     | -12.0 V  | 0.0 A/0.5 A     | ECM100UQ42*†^                |
| 80 W                           | 100 W                         | +5.0 V   | 0.5 A/10.0 A    | +24.0 V  | 0.1 A/2.0 A     | +12.0 V  | 0.0 A/0.8 A     | -12.0 V  | 0.0 A/0.5 A     | ECM100UQ43*†^                |
| 80 W                           | 100 W                         | +5.0 V   | 0.5 A/10.0 A    | +24.0 V  | 0.1 A/2.0 A     | +15.0 V  | 0.0 A/0.8 A     | -15.0 V  | 0.0 A/0.5 A     | ECM100UQ44*†                 |
| 80 W                           | 100 W                         | +5.0 V   | 0.5 A/10.0 A    | +12.0 V  | 0.1 A/3.0 A     | -12.0 V  | 0.0 A/0.8 A     | -5.0 V   | 0.0 A/0.5 A     | ECM100UQ45*†^                |
| 80 W                           | 100 W                         | +5.0 V   | 0.5 A/10.0 A    | +15.0 V  | 0.1 A/3.0 A     | -15.0 V  | 0.0 A/0.8 A     | -5.0 V   | 0.0 A/0.5 A     | ECM100UQ46*                  |

**Notes**

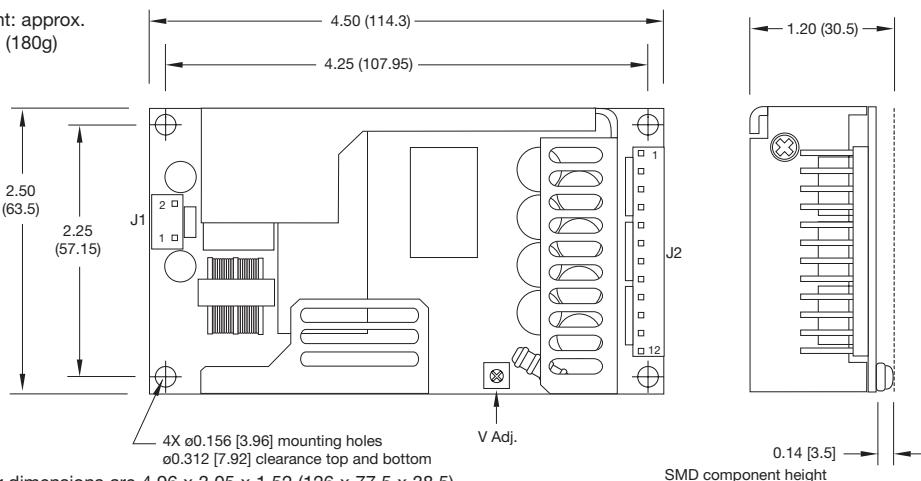
1. To receive unit with cover fitted, add suffix '-C' to model number.  
 2. Output 3 available with opposite polarity for OEM quantities.  
 3. \*\* denotes ECM100 models are class I only, contact sales for class II.

4. 48 VDC input version of 12 V single output model available in OEM quantities (DCM10048S12).

† Available from Farnell. ^ Available from Newark. See pages 204-208.

**Mechanical Details**

Weight: approx.  
0.4 lb (180g)



Cover dimensions are 4.96 x 3.05 x 1.52 (126 x 77.5 x 38.5)

J1 mates with Molex housing 43061-0003 and Molex series 5194 crimp terminals. Optional ground (0.25 faston) tab available.

| Output Connector J2 |          |       |
|---------------------|----------|-------|
| Pin                 | Single   | Multi |
| 1                   | +V1      | +V1   |
| 2                   | +V1      | +V1   |
| 3                   | +V1      | +V1   |
| 4                   | +V1      | +V1   |
| 5                   | V1 RTN   | RTN   |
| 6                   | V1 RTN   | RTN   |
| 7                   | V1 RTN   | RTN   |
| 8                   | V1 RTN   | RTN   |
| 9                   | NOT USED | +V2   |
| 10                  | NOT USED | +V2   |
| 11                  | NOT USED | ±V3   |
| 12                  | NOT USED | -V4   |

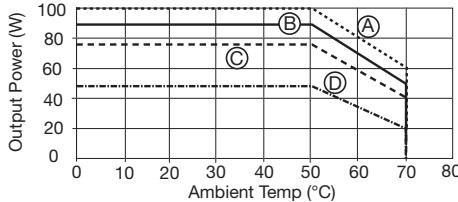
J2 mates with Molex housing 43061-0012 and Molex series 5194 crimp terminals.

**Notes**

1. All dimensions in inches (mm). Tolerance .xx = ±0.02 (0.50); .xxx = ±0.01 (0.25)  
 2. Cable harnesses with 300 mm wire available. For single output models, order part number ECM100S LOOM†. For multi-outputs, p/n ECM100DT LOOM†.  
 3. Mating connector kit available for single output models. Order part number ECM100S CONKIT†.  
 4. Covers available. Order part number ECM100 COVER†^.  
 5. Available in a 3" x 5" footprint for OEM quantities. Contact sales for details.

**Derating Curves**

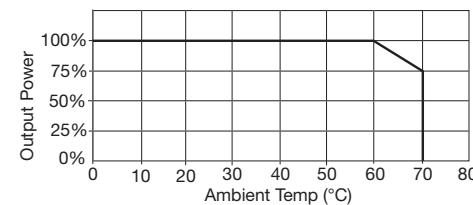
All ECM100 single output models convection-cooled



(A) US24-48  
 (B) US12-18  
 (C) US05  
 (D) US03

Note:  
 1. Derate by 10% if cover is fitted.  
 2. For multi output convection-cooled operation above +50 °C derate linearly to 50% at +70 °C.

All ECM100 models with 5 CFM



Consult longform datasheet for installation information regarding optimum thermal ratings in convection-cooled applications.